


3 credits

24.0 h + 12.0 h

Q1

Teacher(s)	Nieberding Caroline ;SOMEBODY ;
Language :	English
Place of the course	Louvain-la-Neuve
Aims	<p>1 Currently, system biology is widely used in environmental sciences. This class is a theoretical course of genomics and proteomics. It aims at teaching the students the scientific and informatics skills in order to be able to determine DNA sequences of organisms and fine-scale genetic mapping of genomic data. In addition, it gives the students scientific and technical skills in order to deeply understand scientific articles relating to environmental proteomics, and to help them to fit in research teams developing this approach.</p> <p>-----</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Content	<p>Genomics: - Definition and history of genomics - Comparative and functional genomics - The implementations of genomic research - A 2h seminar by Dr. Olivier Jaillon (Genoscope, Evry, France) on the genome duplication of the fish <i>Tetraodon nigroviridis</i> (Nature 431, 946-957) - Informatics resources to analyze the sequence of a DNA contig: alignments by ClustalW in Bioedit, Muscle (MULTiple Sequence Comparison by Log-Expectation) and Mafft, assembly by CAP (Contig Assembly Program), sequence comparison using BLAST (Basic Local Alignment Search Tool), syntactic annotation with GeneMark and GeneWise, functional annotation using ProSite et Pfam, microsatellite motif searching and primer annotation using WebSat (anciennement WebTroll) and Primer3.</p> <p>Proteomics: - definitions, history and main principles ; links with genomics and metabolomics ; - basic techniques : sample preparation, isoelectric focusing, SDS-PAGE, staining, statistical and bioinformatics analysis, DIGE, - Mass spectrometry: theory, machines, applications - Proteomics: databases, informatics, quantitative proteomics. - examples of publications in ecology and ecotoxicology ; critical analysis of an article ; - practical training: small groups are performing two-dimensional gel electrophoresis, scanning the gels and processing the informatics analysis.</p>
Other infos	<p>- basic knowledge in genetics and biochemistry is mandatory ; - the powerpoint slides of the lectures are the didactical support ; - research articles will be discussed during the lectures - For the genomic part, the exam is a written report about the different programs available to analyze a DNA sequence integrating the theory of the lectures - For the proteomic part, the oral exam consists to the critical analysis of a research article.</p>
Faculty or entity in charge	BIOL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Biology of Organisms and Ecology	BOE2M	3		
Master [60] in Biology	BIOL2M1	3		